No. XI.

A Deſcription of a newly invented Globe Time-Piece. By the Rev. BURGISS ALLISON, A. M.

April 4th, 1800.

The committee to whom was referred the communication from Burgiſs Alliſon, report

That having examined the drawing of his globe time-piece and the references they are of opinion that it diſplays conſiderable mechanical ingenuity. They think however that too much has been attempted by the inventor. The part intended to exhibit the phaſes, &c. of the moon is too little connected with the other parts of the machinery, and is not of great importance, as even were it not liable to objection on account of its detached ſituation, it would only ſhew the mean and not the true time at which the different phenomena would occur. An error will alſo ariſe in the apparent place of the ſun on account of the equable motion of circle of illumination. This objection is of no great conſequence. From the mode which the inventor propoſes of making the hours on the *equator* it is evident that the time ſhown by the globe will be for that meridian only on which the hour of ſix is marked. The committee therefore recommend to the inventor to remove the lunar part entirely; and to have the hours marked on a moveable hoop or circle which may be attached to the globe ſo as to ſuit any meridian. Upon the whole however the committee deem the communication worthy of publication.

R. PATTERSON,
JOSEPH CLAY.

Briſtol,

Briſtol, February 28th, 1800.

RESPECTED SIR,

Read April 4th, 1800. IT is now a conſiderable time ſince I have made ſome improvements in different mathematical inſtruments and machines; which I did not, however, think of ſufficient conſequence to preſent to the ſociety: but having not long ſince ſhewn them to ſome of my friends, they have induced me to preſent the incloſed drawing and deſcription of my globe time-piece. If this ſhould meet with a favourable reception, I ſhall be encouraged to bring forward ſome others which I now have by me. The globe time-piece, I have not actually conſtructed, but have begun it, and when finiſhed will with pleaſure exhibit it to the ſociety.

I remain, Sir,

Reſpectfully your humble ſervant,

BURGISS ALLISON.

THOMAS JEFFERSON, ESQ. Preſident of the American Philoſophical Society.

AA is a terreſtrial globe of any convenient ſize, ſay 8 inches in diameter, then will the hours marked on the equator be about 1 inch aſunder. Within the globe is the movement of a ſpring time piece by which the globe is turned round on its axis once in 24 hours. BB is a flat hoop of braſs in which the globe turns as it does in the brazen meridian of common globes, and which ſerves to point out the hours as they paſs in ſucceſſion under it. CC is a light hoop with the minutes marked on it, and which may be carried round by a ſemicircular wire attached to a cannon moving round the north pole, and thence communicating with the internal move-

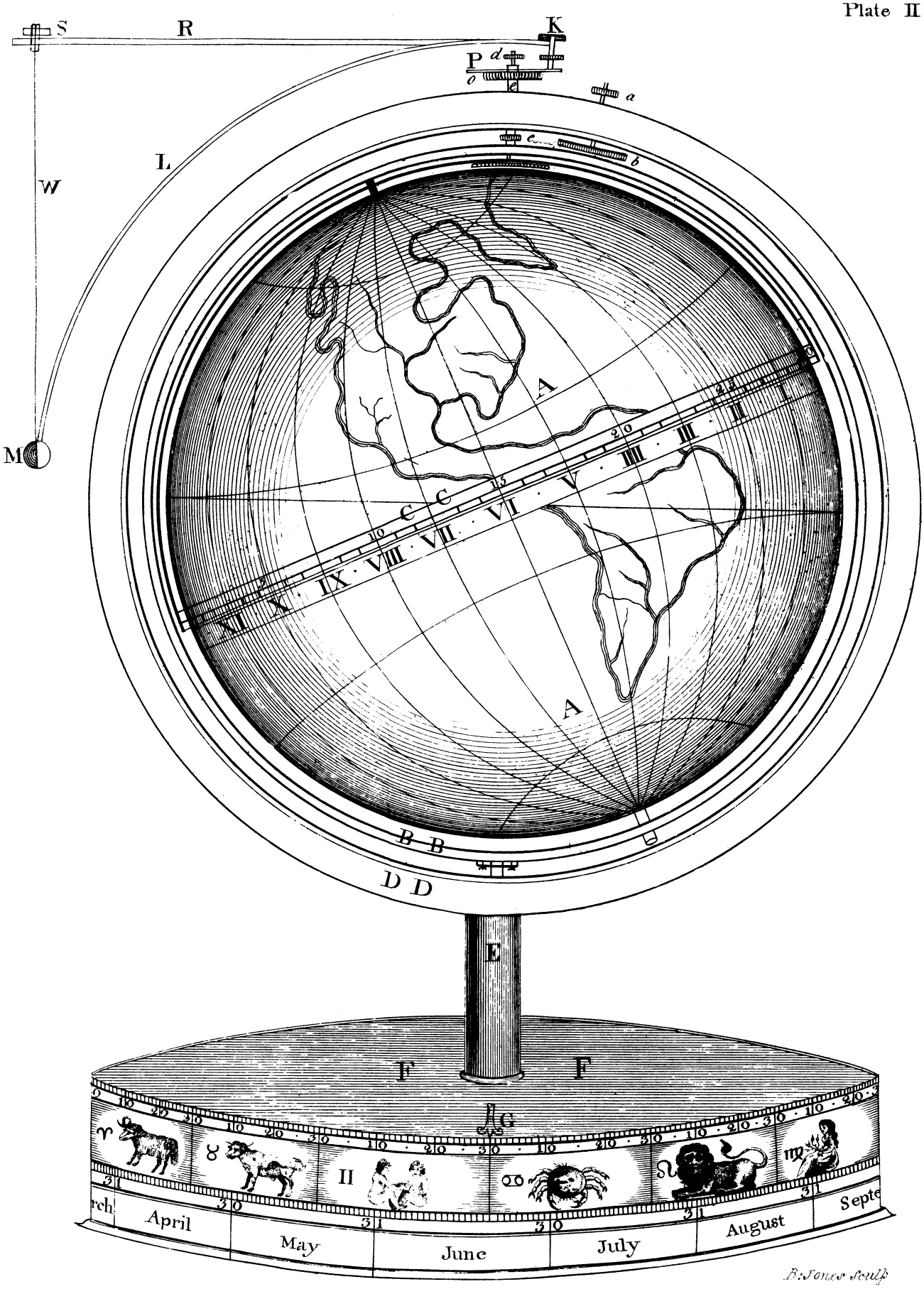
ment. But if the lunar part be added, then the minute circle muſt be carried round by ſimilar arms on the inſide of the globe, and an opening left, next the hour circle, between the northern and ſouthern hemiſpheres, for it to move in; the two hemiſpheres being connected by 4, or more ſmall connecting wires, which may be detached at pleaſure to remove the northern hemiſphere when there is occaſion to come at the movement. Or for conveniency the minutes may be ſhown on a circle round the north pole. DD is a braſs circle moving round once in a year on the poles of the ecliptic, ſhowing the different ſeaſons. This being the circle of illumination, one ſide thereof may be made black to diſtinguiſh the dark hemiſphere. It is carried round by the cannon E which turns round a firm ſupporter that ſuſtains the hoop BB, and of courſe the globe, &c. The cannon carries round with it the circular plane FF on the upper part of the foot to which is attached the ſtem G and which riſing as high as the centre of the circle of illumination and at right angles to it, carries on its top a figure of the ſun, whoſe place in the ecliptic is pointed out on the edge of the foot, on which is alſo drawn the ſigns of the zodiac, day of the month, &c. Or if it ſhould be preferred the ſigns, day of month, &c. may be drawn on the circular plane FF which being left at reſt, while the ſtem bearing the ſun, being connected with the cannon G will point out, ut ſupra, the ſun's place in the ecliptic, &c. M repreſents the moon which is carried round the earth in its proper period by the arm L and axis K being connected with the plate P which revolves round the pole of the ecliptic in about 19 years carrying the axis of the moon's orbit with it in an angle of $5\frac{1}{2}$ degrees this is effected in the following manner. The plate P with its wheel O is moved round a cannon fixed to the hoop BB by which

the

the wheels a, b, c, are turned, the laſt of which being immoveable on the fixed cannon e turns the wheel b ſince with its axis it move round the ſaid cannon, which is the pole of the ecliptic, once in a year. Again the moon's axis K is turned by a wheel d fixed to an arbor paſſing through the cannon e and on its lower end carrying another wheel, which is turned one tooth per day, by a pin fixed in the globe. If it is required for the moon to turn on its axis ſo as to keep the enlightened ſide to the ſun, it may be done by ſubſtituting for the arc L, the horizontal arm R at the extremity of which let there be the arbor and wheel S of the ſame ſize as the wheel at K and turned by it with its wire W at the lower end of which is the moon. It is obvious from the diſtance of the wheels that they are deſigned to be turned by bands. And here I ſhall avail myſelf of Mr. Hawkins's newly invented ſpiral wire bands, which being elaſtic are applicable to all kinds of machinery without the inconveniency of altering with the weather.

The piece is wound up by a key at the ſouth pole, which pole is a cannon connected with a frame within the globe, containing the wheel work: and the north pole is the ſame being firmly fixed to the hoop BB. The cannon E and circle DD are made to revolve once a year in the following manner. On the poſt within the cannon E is a lever, which once a day is drawn aſide by a pin fixed in the globe near the antarctic circle, and by a wire attached to its lower end, a crank near the edge of the foot is pulled, by which a circle having 365 teeth is moved one tooth per day, which wheel is connected with the plane FF, unleſs that is deſigned to be ſtationary, and in that caſe, the wheel muſt connect with the cannon E by a wire which will ſerve to ſupport the ſun's ſtem, and the movement is effected. From the

the deſcription and drawing it is eaſy to conceive that the following problems may be done by the machine. 1. The hour and minute of the day. 2. The hour and minute of ſun-riſing and ſetting in every part of the world, as the places paſs in ſucceſſion before or behind the circle of illumination. 3. The different ſeaſons, and lengths of day and night. 4. The ſun's place in the ecliptic and day of the month. 5. The phaſes of the moon; her age, place of nodes, eclipſes, riſing, ſetting and ſouthing, in every part of the world, ſhewn by a wire circle of lunar illumination attached to the moon's axis and at right angles to the plane of her orbit; whoſe interſection with the ſolar circle of illumination, will ſhew the height of the ſun, at the riſing or ſetting of the moon.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